Claims

What is claimed is:

1. A method, comprising:

issuing PTSE information from a node, said PTSE information describing a link within an ATM PNNI network, said PTSE information further comprising:

a) a per priority level breakdown of bandwidth reserved on said link;

b) a per service category breakdown of over-subscription factors, or, information from which a per service category breakdown of over-subscription factors can be determined.

2. The method of claim 1 wherein said PTSE information is a Horizontal Link PTSE information type.

3. The method of claim 1 wherein said PTSE information further comprises SIG information containing:

said per priority level breakdown of bandwidth reserved on said link and

said per service category breakdown of over-subscription factors, or, said information from which a per service category breakdown of over-subscription factors can be determined.

4. The method of claim 1 wherein one of said service categories is a CBR service.

5. The method of claim 1 wherein one of said service categories is a VBR service.

6. The method of claim 1 wherein one of said service categories is an ABR service.

7. The method of claim 1 wherein said link is not within a LCN exhaustion state.

8. The method of claim 1 wherein said link is within an LCN exhaustion state and said PTSE information further comprises:

c) a per priority level breakdown of whether or not a connection exists on said link; and,

d) an indication of the actual maximum capacity of said link and an advertised maximum capacity value set equal to zero;

e) a per service category breakdown of actual available capacity on said link and an advertised available capacity value set equal to zero for each of said service categories.

9. A method to assist in deciding whether or not a ATM PNNI network link is able to sustain a new connection, comprising:

if said link is not within an LCN exhaustion state and said new connection requests more bandwidth than is advertised as being available upon said link for said new connection's service category, regarding the bandwidth available for said new connection as a sum, said sum comprising addition of:

1) said advertised available bandwidth and

2) the total bandwidth reserved on said link for connections having lower priority than said new connection enhanced by over-subscription for said service category.

10. The method of claim 9 further comprising deciding that said link is not able to sustain said new connection because said bandwidth requested by said new connection exceeds said sum.

11. The method of claim 9 further comprising deciding that said link is able to sustain said new connection because said sum exceeds said bandwidth requested by said new connection.

12. The method of claim 9 further comprising deciding that said link is not able to sustain a second new connection because said second new connection requests more bandwidth than an advertised maximum bandwidth of said link.

13. The method of claim 9 further comprising:

if said link is within an LCN exhaustion state and a second new connection requests more bandwidth than is indicated via SIG information as being available upon said link for said second new connection's service category, regarding the bandwidth available for said second new connection as a sum, said sum comprising addition of:

1) said bandwidth indicated via SIG information and

2) the total bandwidth reserved on said link for connections having lower priority than said second new connection enhanced by over-subscription for said second connection's service category.

14. The method of claim 13 further comprising detecting said LCN exhaustion state by recognizing that:

1) said advertised available bandwidth has been set equal to zero; and,

2) an advertised maximum bandwidth of said link has been set equal to zero.

15. The method of claim 13 further comprising deciding that said link is not able to sustain said second new connection because said bandwidth requested by said second new connection exceeds said sum.

16. The method of claim 13 further comprising deciding that said link is able to sustain said second new connection because said sum exceeds said bandwidth requested by said second new connection and because there exists a pre-established connection on said link having a lower priority than said second new connection, said pre-established connection being indicated via SIG information describing a per priority level breakdown of whether or not a pre-established connection exists on said link.

17. The method of claim 13 further comprising deciding that said link is not able to sustain said second new connection even though said sum

exceeds said bandwidth requested by said second new connection because there does not exist a pre-established connection on said link having a lower priority than said second new connection, said lack of a pre-established connection being indicated via SIG information describing a per priority level breakdown of whether or not a pre-established connection exists on said link.

18. A method, comprising:

a) updating an understanding of an ATM PNNI network after reception of PTSE information, said understanding including an understanding of a link within said network, said PTSE information having SIG information that comprises:

1) a first per priority level breakdown of bandwidth reserved on said link;

2) a first per service category breakdown of over-subscription factors; and,

b) deciding whether said link is able to sustain a new connection, said deciding comprising, if said new connection's bandwidth exceeds an available bandwidth for said new connection found within said PTSE information, regarding the bandwidth available for said new connection as a sum, said sum comprising addition the of:

1) said available bandwidth and

2) the total bandwidth reserved on said link for connections having lower priority than said new connection enhanced by over-subscription calculated with a said over-subscription factor for said service category.

19. The method of claim 18 wherein said available bandwidth is:

1) advertised according to a technique specified by a PNNI standard if said link is not in an LCN exhaustion state; or,

2) broadcasted within SIG information if said link is within an LCN exhaustion state.

20. The method of claim 18 further comprising deciding that said link is not able to sustain said new connection because said bandwidth requested by said new connection exceeds said sum.

21. The method of claim 18 further comprising deciding that said link is able to sustain said new connection because said sum exceeds said bandwidth requested by said new connection.

22. The method of claim 18 further comprising deciding that said link is able to sustain said new connection because said sum exceeds said bandwidth requested by said new connection and because there exists a pre-established connection on said link having a lower priority than said new connection, said pre-established connection being indicated via SIG information describing a per priority level breakdown of whether or not a pre-established connection exists on said link, said link in an LCN exhaustion state.

23. The method of claim 18 further comprising deciding that said link is not able to sustain said new connection even though said sum exceeds said bandwidth requested by said new connection because there does not exist a pre-established connection on said link having a lower priority than

said new connection, said lack of a pre-established connection being indicated via SIG information describing a per priority level breakdown of whether or not a pre-established connection exists on said link, said link in an LCN exhaustion state.

24. A machine readable medium having stored thereon a sequence of instructions which when executed by a processor cause said processor to perform a method, said method comprising:

preparing PTSE information to be issued from a node, said PTSE information having information describing a link within an ATM PNNI network, said information further comprising:

a) a per priority level breakdown of bandwidth reserved on said link;

b) a per service category breakdown of over-subscription factors, or, information from which a per service category breakdown of over-subscription factors can be determined.

25. The machine readable medium of claim 24 wherein said PTSE information is a Horizontal Link PTSE information type.

26. The machine readable medium of claim 24 wherein said PTSE information further comprises SIG information containing:

said per priority level breakdown of bandwidth reserved on said link and

said per service category breakdown of over-subscription factors, or, said information from which a per service category breakdown of over-subscription factors can be determined..

27. The machine readable medium of claim 24 wherein one of said service categories is a CBR service.

28. The machine readable medium of claim 24 wherein one of said service categories is a VBR service.

29. The machine readable medium of claim 24 wherein one of said service categories is an ABR service.

30. The machine readable medium of claim 24 wherein said method further comprises said deciding when said link is not within a LCN exhaustion state.

31. The machine readable medium of claim 24 wherein said method further comprises said deciding when said link is within an LCN exhaustion state and said PTSE information further comprises:

c) a per priority level breakdown of whether or not a connection exists on said link; and,

d) an indication of the actual maximum capacity of said link and an advertised maximum capacity value set equal to zero;

e) a per service category breakdown of actual available capacity on said link and an advertised available capacity value set equal to zero for each of said service categories.

32. A machine readable medium having a sequence of instructions which when executed cause a processor to perform a method to assist in

deciding whether or not a ATM PNNI network link is able to sustain a new connection, said method comprising:

if said link is not within an LCN exhaustion state and said new connection requests more bandwidth than is advertised as being available upon said link for said new connection's service category, regarding the bandwidth available for said new connection as a sum, said sum comprising addition of:

1) said advertised available bandwidth and

2) the total bandwidth reserved on said link for connections having lower priority than said new connection enhanced by over-subscription for said service category.

33. The machine readable medium of claim 32 wherein said method further comprises deciding that said link is not able to sustain said new connection because said bandwidth requested by said new connection exceeds said sum.

34. The machine readable medium of claim 32 wherein said method further comprises deciding that said link is able to sustain said new connection because said sum exceeds said bandwidth requested by said new connection.

35. The machine readable medium of claim 32 wherein said method further comprises deciding that said link is not able to sustain a second new connection because said second new connection requests more bandwidth than an advertised maximum bandwidth of said link.

36. The machine readable medium of claim 32 wherein said method further comprises:

if said link is within an LCN exhaustion state and a second new connection requests more bandwidth than is indicated via SIG information as being available upon said link for said second new connection's service category, regarding the bandwidth available for said second new connection as a sum, said sum comprising addition of:

1) said bandwidth indicated via SIG information and

2) the total bandwidth reserved on said link for connections having lower priority than said second new connection enhanced by over-subscription for said second connection's service category.

37. The machine readable medium of claim 36 wherein said method further comprises detecting said LCN exhaustion state by recognizing that:

1) said advertised available bandwidth has been set equal to zero; and,

2) an advertised maximum bandwidth of said link has been set equal to zero.

38. The machine readable medium of claim 36 wherein said method further comprises deciding that said link is not able to sustain said second new connection because said bandwidth requested by said second new connection exceeds said sum.

39. The machine readable medium of claim 36 wherein said method further comprises deciding that said link is able to sustain said second new connection because said sum exceeds said bandwidth requested by said second new connection and because there exists a pre-established connection on said link having a lower priority than said second new connection, said pre-established connection being indicated via SIG information describing a per priority level breakdown of whether or not a pre-established connection exists on said link.

40. The machine readable medium of claim 36 wherein said method further comprises deciding that said link is not able to sustain said second new connection even though said sum exceeds said bandwidth requested by said second new connection because there does not exist a pre-established connection on said link having a lower priority than said second new connection, said lack of a pre-established connection being indicated via SIG information describing a per priority level breakdown of whether or not a pre-established connection exists on said link.

41. A machine readable medium having a sequence of instructions which when executed by a processor cause said processor to perform a method, said method comprising:

a) updating an understanding of an ATM PNNI network after reception of PTSE information, said understanding including an understanding of a link within said network, said PTSE information having SIG information that comprises:

1) a first per priority level breakdown of bandwidth reserved on said link;

2) a first per service category breakdown of over-subscription factors; and,

b) deciding whether said link is able to sustain a new connection, said deciding comprising, if said new connection's bandwidth exceeds an available bandwidth for said new connection found within said PTSE information, regarding the bandwidth available for said new connection as a sum, said sum comprising addition the of:

1) said available bandwidth and

2) the total bandwidth reserved on said link for connections having lower priority than said new connection enhanced by over-subscription calculated with a said over-subscription factor for said service category.

42. The machine readable medium of claim 18 wherein said available bandwidth is:

1) advertised according to a technique specified by a PNNI standard if said link is not in an LCN exhaustion state; or,

2) broadcasted within SIG information if said link is within an LCN exhaustion state.

43. The machine readable medium of claim 41 wherein said method further comprises deciding that said link is not able to sustain said new connection because said bandwidth requested by said new connection exceeds said sum.

44. The machine readable medium of claim 41 wherein said method further comprises deciding that said link is able to sustain said new

connection because said sum exceeds said bandwidth requested by said new connection.

45. The machine readable medium of claim 41 wherein said method further comprises deciding that said link is able to sustain said new connection because said sum exceeds said bandwidth requested by said new connection and because there exists a pre-established connection on said link having a lower priority than said new connection, said pre-established connection being indicated via SIG information describing a per priority level breakdown of whether or not a pre-established connection exists on said link, said link in an LCN exhaustion state.

46. The machine readable medium of claim 41 wherein said method further comprises deciding that said link is not able to sustain said new connection even though said sum exceeds said bandwidth requested by said new connection because there does not exist a pre-established connection on said link having a lower priority than said new connection, said lack of a pre-established connection being indicated via SIG information describing a per priority level breakdown of whether or not a pre-established connection exists on said link, said link in an LCN exhaustion state.